CASE OF PRIMARY DEEP VENOUS REFLUX

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A 36-year old gentleman from Western Samoa has had recurrent venous ulcerations of both legs that first began when he was 15 years old. He has had at least 15 recurrent ulcers mainly on the anterior and lateral aspect of the right lower leg. He has not been able to work for the past 4 years because of painful, large ulcerations of the right leg. His weight is 340 pounds. He has normal pulses in his foot arteries.

Level 1: There is moderate swelling of both legs with extensive lipodermatosclerosis of both lower legs. Large varicose veins are visible. Large ulcer on the outside of the right leg above the lateral malleolus, smaller ulcer anteriorly (Fig. 1). Hand-held Doppler examination showed significant reflux of the GSV and popliteal vein.

Level 2: Duplex scanning of the right leg showed significant axial reflux of the superficial femoral and popliteal vein, as well as the GSV. There were at least 2 medial and 2 lateral incompetent perforators. APG could not be performed because of the size of his calves.

Level 3: Ascending venography did not show any signs of postthrombotic changes. Descending venography showed cascading axial reflux through the common and superficial femoral and popliteal vein into the calf veins - Kistner 4 (Fig. 2). The deep femoral vein was competent (Fig. 3). The reflux of the GSV was confirmed. No incompetent perforators were seen. Lymphoscintigraphy showed irregular channels in the calf with localized dermal backflow with otherwise good lymphatic flow from the foot to the pelvis.

CEAP classification: C2,3,4,5,6,s; Ep; As,p,d; Pr2,3,11,13,14,15,18

Treatment?

(See figures on next page)

DISCUSSION

DR. O'DONNELL: I think we have two votes for a staged approach-treating the superficial system first and then reserving deep venous reconstruction for recurrence of ulceration. I'd be curious since we have many experts on the stage, Raj, what would you do in this case? Would you wait for the ulcer to heal on conservative therapy and then do the surgery or would you do the surgery right away?

DR. RAJU: The presence of active ulcer has not affected the outcome in any significant fashion. So I think it's a waste of time to wait for the ulcer to heal. Whether you do it in stages or do a complete hemodynamic correction I think depends on the patient. If it's a patient whom you think would tolerate staged procedures, i.e., do a little bit and wait for it to recur after six or seven years and do something else, that's okay. Generally speaking, very young patients and very old patients, those two extremes, you need to do the radical procedure because -- they may not come back if you do something less than total correction and the disease recurs. So I think it's a matter of clinical judgment.

DR. DEPALMA: I'd be happy if the patient didn't come back. I think this is a terribly high-risk patient, and I have dealt with some of these Samoans actually out in the West Coast. I would bet he's diabetic. I don't know if that test has been done. He's not. Okay. The weight, the driving weight of the abdomen, is the factor causing the venous insufficiency, not some magical thing with the valves. I would almost be tempted to send him to a member of my department for gastric partition first. I would probably recommend that because his life expectancy is shortened with this obesity. I would treat the ulcer locally probably with Circaid devices because stockings would never fit. I would also consider doing a lateral SEPS. I have done lateral SEPS in a very obese patient, and you can come down just posteriorly and get into a compartment and find perforators. I've got some pictures of such a procedure. I would do some local thing there or just put them in the stockings. The other thing I would do is to try to heal the ulcer. Medical therapy wasn't mentioned, doxycycline or tetracycline twice a day. A metalloprotease inhibiter tends to inhibit this kind of inflammation and skin change. I would prescribe these chronically. I would stay away from the deep system in this man. I personally would be afraid of getting a pulmonary embolus.

DR. DALSING: I think this patient's weight is a major problem and I think it would be very difficult to gain access to the deep system. I also would have liked to have seen the first portion of the descending venogram to know if I really had valves to work on. I may have missed it on the second part of the venogram, I couldn't tell if there was one there or not. I think if I had to do something and if we took care of some of his weight, I'd do the superficial stripping first with the perforators and then see what happened before approaching the deep system.

DR. GLOVICZKI: I agree with Bob that these types of patients, who come from a long distance, they come and they would like to have a complete operation. They have one chance. You want to fix all problems. Not very long ago I had a patient from Turkey where I did the same thing. I did SEPS, stripping and deep venous valve reconstruction. I am hesitant to do it all at one stage same day, and the reason I am is because I anticoagulate my deep venous reconstruction patients, but I would be hesitant to do that to patients who have stripping and SEPS and avulsion of varicose veins. So I would do the SEPS and the superficial ablation, and then probably a few days later I would do the deep vein reconstruction and full anticoagulation and then send the patient back to Samoa or Bora Bora.

DR. O'DONNELL: It's not bleeding with SEPS that you fear, but rather bleeding with avulsion of the greater saphenous. Many of us combine perforator interruption with deep venous reconstruction and use peri-operative anti-coagulation.

DR. GOREN: I applaud the panel's conclusion that a staged approach is best in these types of cases. I also fully agree with Dr. O'Donnell's statement regarding the existence of overload incompetence of the deep venous system caused by a hemodynamically significant superficial reflux existing in certain cases of varicose veins. I will illustrate this with three slides from a case study

Figure 1.– Large clover-shaped ulcer of the right leg which is swollen with extensive lipodermatosclerosis.

Figure 2.– Descending venogram of the right leg through catheterization of the left femoral vein showed cascading axial reflux (Kistner grade 4) through the common and superficial femoral, into the popliteal and tibial veins.

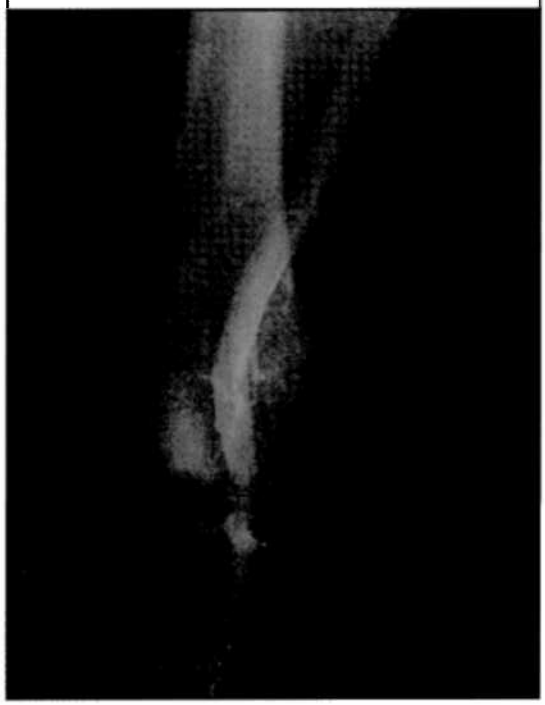


Figure 3.– Descending venogram showed that the deep femoral vein was competent.

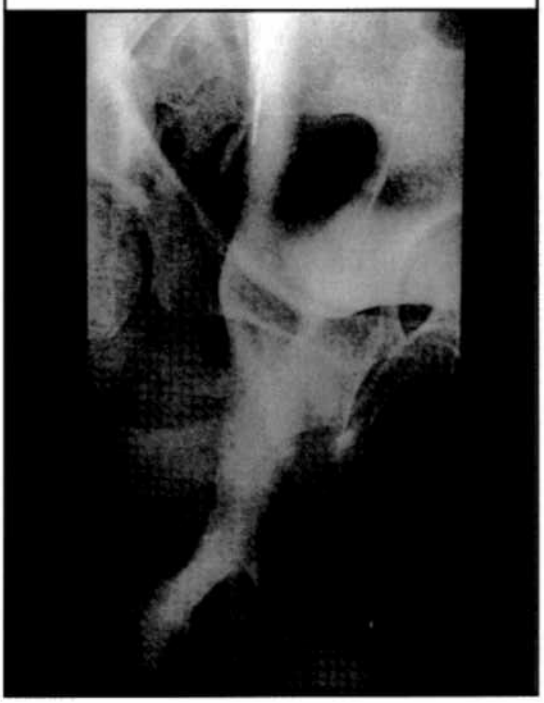
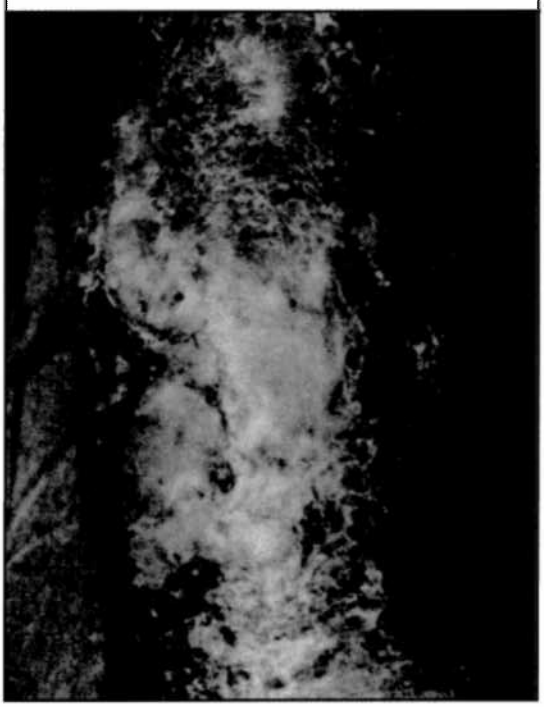


Figure 4.– Healing of the ulcerations after high ligation and stripping of the long saphenous vein, multiple perforator ligations and transposition of the incompetent superficial femoral vein into the competent deep femoral vein.



encountered in my practice. A middle-aged gentleman, college professor, consulted me for huge and neglected left long saphenous varicosities with obvious signs of chronic venous insufficiency (C5-6). On Doppler ultrasound examination he was found to have both superficial and deep (popliteal and superficial femoral) vein incompetence. An APG examination revealed a VFI of 9.1 ml/sec. The test was immediately repeated with finger occlusion of the long saphenous vein against the tibial condyle. The VFI dropped to only 5.3 ml/sec validating the existence of a significant deep reflux. Both his EF as well as RVF worsened, probably due to retrograde ejection through incompetent perforators. Two years after complete surgery for his long saphenous varicosities (with no perforator surgery) his VFI returned to normal at 1.48 ml/sec and his EF and RVF were normalized as well. In the case presented here before us, there are additional aggravating factors to reckon with. One is the excess weight and the other is a possible diminished calf pump function due to a limitation of movement in the ankle joint. Prof. Hach of Germany has described this condition namely the ankle joint failure as the "artherogenic congestion syndrome". I would like also to emphasize that some of these CVI patients have secondary gains from the condition. The whole family is catering to the patient who is the center of attention. Possibly too, these people are getting financial assistance for their disability so that the incentive to get well is simply not there. In my practice if I encounter a non-cooperating patient, he/she will be released and advised to seek help from someone else.

DR. KRYLOV: I have a question to our distinguished moderator. When you're doing these endoscopic repairs do you use anticoagulation?

DR. O'DONNELL: Do I use anticoagulation? Yes. Postoperatively these patients receive anticoagulation because I had two internal valvuloplasties that thrombosed while not receiving anticoagulation. I know some of the other panelists don't anticoagulate. They were the only deep venous reconstructive procedure in my experience that's thrombosed. Now all of my deep venous reconstructions get therapeutic heparin.

DR. KRYLOV: And the patient is ambulated anyway?

DR. O'DONNELL: Yes. The patient after a procedure like this is ambulatory with a little difficulty because they have a groin incision.

DR. KRYLOV: You are not keeping him in bed?

DR. O'DONNELL: No, I'm not keeping him in bed. Why should I keep him in bed?

DR. KRYLOV: And a question to Dr. Kistner. In this case if you will find the valve below the profunda you could repair that, but if you will open the vein and you will not find the valve, what do you do in that case? The phlebogram is not 100 percent distinctive. You just see something which could be the valve. It is especially bad that we are more and more relying on the duplex data, and the duplex is even less accurate than a phlebogram. What would you do in a case if you will not find the valve but the vein is already open?

DR. KISTNER: I think that brings up a good point. If you're going to do venous reconstruction, you need to know a fallback procedure, and in this man I think there is an excellent fallback procedure because he has a competent profunda system and could well be treated by a transposition.

DR. O'DONNELL: But what would happen if you didn't have that valve function and you got in there? What would you do next? I think that's Dr. Krylov's point.

DR. KISTNER: The profunda valve does function.

DR. O'DONNELL: But he's saying in a hypothetical case it doesn't. You get in there. It doesn't. Then what would you do?

DR. KISTNER: Then your fallback position is probably an axillary transplant.

DR. KRYLOV: With false positive data on the phlebogram, due to twisting of the vein, the picture will indicate that the valve is competent, but actually the valve is not present.

DR. KISTNER: Are you speaking of the superficial femoral valve or the profunda valve?

DR. KRYLOV: No, superficial femoral.

DR. KISTNER: Yes, I agree with you. Sometimes you get there and it's not what you thought. The first thing we would do as we approach the vein is an adventitial dissection to look for the white line of insertion of the valve cusp. If that line is not complete, then we know that we're not going to get a competent valve if we try to repair it. Then I would go probably to the transposition procedure.

DR. KRYLOV: In my situation I prefer to open the vein in the sinus, and in this case I can simply close the vein and make something else including this transposition.

DR. BELCARO: I think that one of the important requisites of valvuloplasty is that it be done only in subjects without severe conditions or complications like obesity or diabetes. I think it should ideally be done only in normal subjects.

DR. O'DONNELL: If they were normal subjects, we wouldn't be doing them.

DR. BELCARO: By "normal" I mean normal weight, body mass index, not diabetics, and so on. I mean only patients with pure primary incompetence. Also, I want to say to Professor Perrin that the follow up of valvuloplasty (which we call limited external valvuloplasty) now include more than ten years including more than 60 patients. We think it's a very useful procedure if you limit valvuloplasty mainly to patients with primary incompetence. About secondary incompetence due to post-thrombotic syndrome, most of these patients (maybe 35 percent) may have a thrombophilia or some situation which can predispose them to new episodes of thrombosis. I don't think that (unless we have special cases) in post-thrombotic syndrome we should actually use valvuloplasty. In primary incompetence we can perform valvuloplasty and it's very effective. In secondary incompetence due to post-thrombotic syndrome we really need some guidelines because only a very limited amount of patients can benefit from this procedure.

DR. KISTNER: I guess my question is whether there is a primary incompetent valve in association with post-thrombotic disease. If so, I treat them as a primary valve problem with valvuloplasty and expect to get good results. If it is a scarred valve, I have not been successful with freeing up the scarring and having it become functional. I think maybe Raj has a better experience and would like to hear what he has to say about it.

DR. RAJU: I think some post-thrombotic valves can be repaired, but you should feel good about it. If the quality of repair is good, then it's reasonable to expect a good result. I do not think general surgeons should be doing valve reconstruction, not because they are general surgeons. I think anybody who does this has to focus on venous disease to a large extent. I think otherwise the patient gets the short shift.

DR. O'DONNELL: I think we've all seen three or four patients who have had vascular surgeons who do occasional venous surgery have this short shift, as you say.

DR. NEGLEN: I have a question for you, Bob. Have you ever had to do an axillary vein transplant in a primary sufficiency patient, and if you had, how often do you find that the axillary valve appears insufficient too?

DR. KISTNER: Peter, I don't have enough experience to tell you. If I've done them, it's been just once or twice that I've had to take an axillary vein to put down there. So I don't know, but I think you have better data on that. Why don't we reverse the question?

DR. TRIPATHI: This is a question for Bob. Nobody is talking about venous ligation, and in patients who have got valvular dysplasia or aplasia, what is the role of venous ligation if the profunda axis is quite good and competent?

DR. KISTNER: If you have aplasia without any other competent axial segment, ligation doesn't play a role. I think you're just stuck in that situation. The only possibility that I know of is a cryopreserved homograft valve.

DR. TRIPATHI: What are the options when the profunda is okay or competent and what are the options when the profunda is not competent?

DR. KISTNER: If the profunda is competent, you always have the alternative of a transposition which is my second choice. If the profunda is not competent, then I don't think reconstructive surgery, would play a role, unless you have a very severe advanced case, and certainly not in this kind of a patient.

DR. TRIPATHI: And how does ligation compare in a case where profunda is competent with transposition?

DR. KISTNER: If the profunda is competent, a compromised (partially thrombosed) superficial femoral vein can be ligated with good results. If there is still good outflow through the SFV, we prefer transposition to ligation.

DR. DEPALMA: There's one way of looking at that, and that is on the operating table to occlude the superficial femoral vein and measure the pressure in the foot and in the arm the way that Raju does, then change the position. And see if you tilt the table down or if you clamp the vein in the supine position and the pressure in the foot goes up, do not ligate the superficial vein.

DR. DALSING: Just one comment. If the question was, can you ligate a superficial femoral vein with a competent profunda? It would probably be okay. Bob has actually looked at that question and found no long-term disability. If you have a clot within the SFV and you ligate it, even if it doesn't involve the entire vein and the profunda is normal, you should be all right. However, if the profunda is incompetent, then you have a problem long-term.

DR. GARCIA-RINALDI: I'd like to ask Dr. Kistner that if we feel that the concept of overflow is the cause of venous dilatation and incompetence, how many of the transposition cases into the deep femoral have indeed developed insufficiency of the valve.

DR. KISTNER: The concept that overflow in the venous system causes venous dilation of the unobstructed deep system makes little sense to me. I really don't understand it. If you really have valvular pathology, I don't believe cutting off saphenous inflow is going to cause that valve to work again unless there is proximal obstruction. I don't understand that physiologic concept very well, so someone else will have to speak to that.

DR. O'DONNELL: Well, we didn't understand it well because it's similar to the state of carotid disease before the availability of duplex scans to detail the extent of carotid occlusive disease. Similarly there was valvular incompetence in many of these patients whom we thought had primary varicosities. Certainly in my practice it's not unusual to encounter a number of patients with incompetence of the superficial femoral valve with reflux by duplex scan. Following a standard ligation and stripping the reflux disappears post-operatively.

DR. KISTNER: Is that a total axial reflux, Tom, or segmental?

DR. O'DONNELL: It's segmental, maybe includes the mid-thigh valve, but the popliteal is usually competent.

SURGICAL MANAGEMENT

DR. EKLOF: This patient comes from Western Samoa. We found out that he had eight male relatives, all uncles that had the same problem as this young man had. Since their early teens they developed recurrent venous ulcers of both legs. Our patient came to Hawaii about eight years ago. He is a very healthy, big, strong Samoan. Typical football player with a perfect calf muscle pump function. He has no ankle problems. He has never had DVT. He had been treated for a long time with Unna boots without any effect on healing. So when he was referred to us we did all the investigations that I showed to you, and we tried to continue conservative treatment to at least try to heal his ulcers before surgery. We were not successful. So after marking his perforators with a scanner the day before surgery, we did high ligation and stripping of the GSV. We also did perforator ligation with small incisions on the medial and the lateral side, where we found big perforators four to five millimeters wide. We explored the common femoral, and the deep and superficial femoral veins in search of the valve that was quite beautifully shown on the venogram. We did a very careful excision of the adventitia, and could only see one cusp. Since we couldn't identify the opposing cusp, we couldn't do an external valvuloplasty. We decided to divide the superficial femoral vein, and we looked into its proximal part and found that he had only one valve cusp. We did a transposition of the superficial femoral vein into the competent deep femoral vein. This was in July. His pain disappeared immediately after his reflux was repaired. We have done several scans and it is completely competent. We skin grafted his ulcers and they are completely healed (Fig. 4). He has decreased his weight by about 20 pounds and he plans to go back to work.

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